

Novel Mobile Application to Promote Evidence-Based Medicine Decision-Making in Medical Education

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Abstract Boston University School of Medicine's Finding Information Framework was created to help medical students structure and categorize their clinical questions and then link them directly to the most appropriate information resource. This tool has been developed into a mobile application to reinforce this framework, allowing immediate utilization of evidence-based medicine (EBM) tools.

Keywords Evidence Based Medicine · EBM ·
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Paper

Evidence-based medicine (EBM) is a systematic approach to clinical decision-making, which incorporates the most

appropriate clinical evidence from current research with patient values, in deciding the best course of treatment. Boston University School of Medicine (BUSM) has addressed the challenges of applying EBM by developing a custom-made tool called Finding Information Framework (FIF) to assist learners, at a formative stage in their training, in utilizing EBM resources in clinical decision-making [1, 2].

The FIF, a conceptual algorithm, was created to help medical students structure and categorize their clinical questions and then link them directly to the most appropriate information resource. The FIF, similar to a mathematical factor tree, helps students define their question by determining whether they have a background or foreground question. Students then move through the algorithm to resources such as textbooks and PubMed for basic science questions, UpToDate for clinical background questions, and DynaMed for point-of-care foreground questions. The FIF has direct links to these digital resources through BUSM's Alumni Medical Library.

In collaboration with the designers of FIF, a mobile application has been developed to reinforce this framework. The research team emphasized best practice features identified in the current literature to design a user-friendly app to effectively present the framework. The pilot app was programmed in App Inventor, but several problems were encountered. These limitations led to collaboration with BU's Global App Initiative group to build the app natively with the initial wireframe designed in Balsamiq. The Android app was built using Android SDK, and the iOS app was built in Xcode with Objective C. Interfaces for both platforms were designed using Sketch, Adobe Photoshop, and Illustrator. The application was developed natively instead of as a web-based app to allow more customizable features to make the app more interactive [3].

Working with student designers, the app included several features to increase the interactivity of FIF including definitions/examples of each category for increased user independence and familiarity with framework, easy access toolbar, important visual

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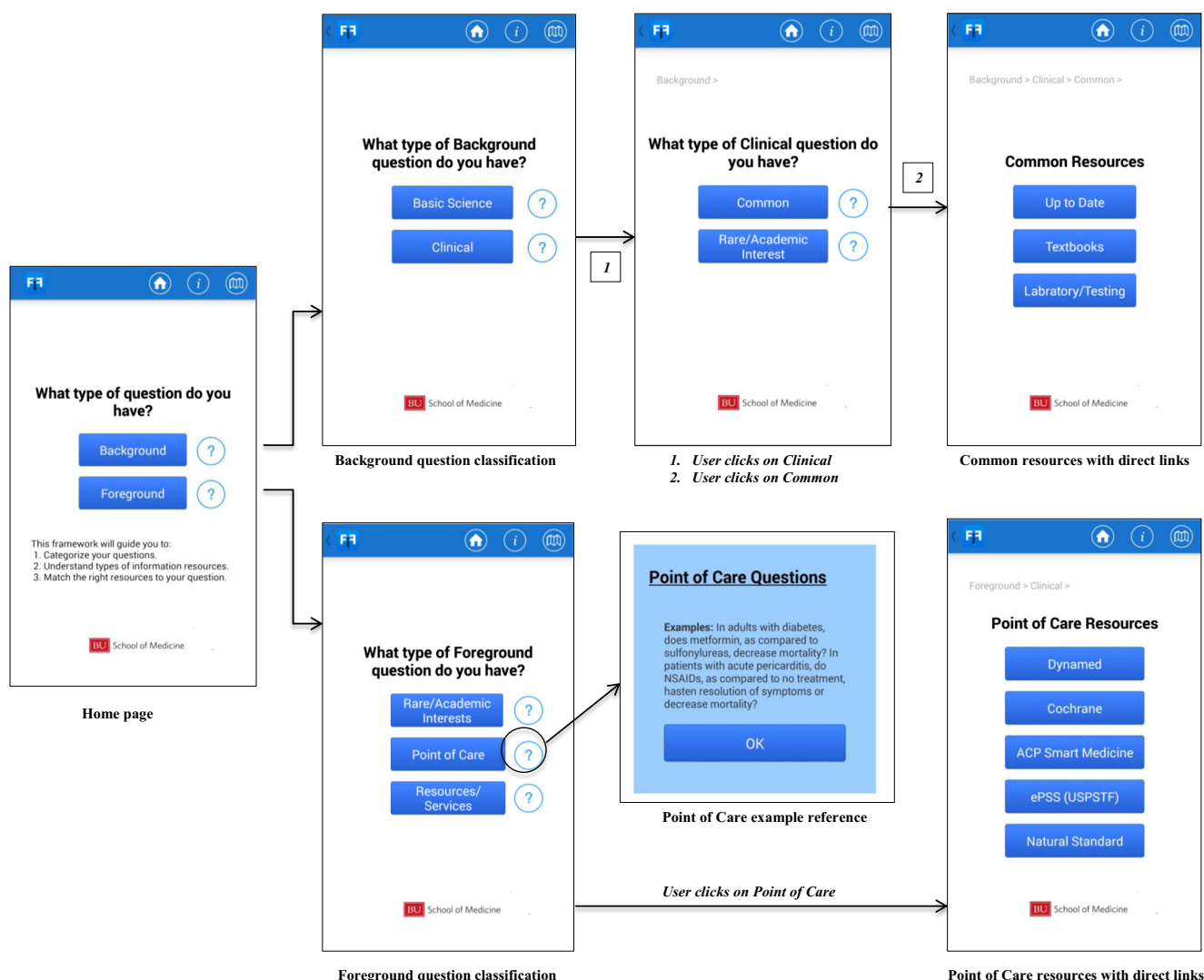


Fig. 1 Sample user interface categorizing a background or foreground medical question

cues to increase user satisfaction through the use of a splash screen, button design, blue color theme, and reinforcement of FIF principles through breadcrumb navigation (Fig. 1).

The use of the web-based FIF tool has been introduced to BUSM students through didactic teaching in years 1 and 2 and has been very well received. Preliminary results evaluating the helpfulness and usability of the mobile app by a pilot group ($n=8$) of medical students and faculty were very positive. Majority of the participants had experience with clinical apps, and overall identified the app as easy to understand and navigate, and would utilize the app during their medical education. Future studies will expand on these results and will target both 3rd and 4th-year students through focus groups evaluating not only the user interface but also the effectiveness of FIF as a clinical decision-making tool. With its clear mobile interface, this novel FIF app aims to help medical students practice EBM by providing direct access to digital databases to aid in their clinical decision-making.

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